FIG. 1

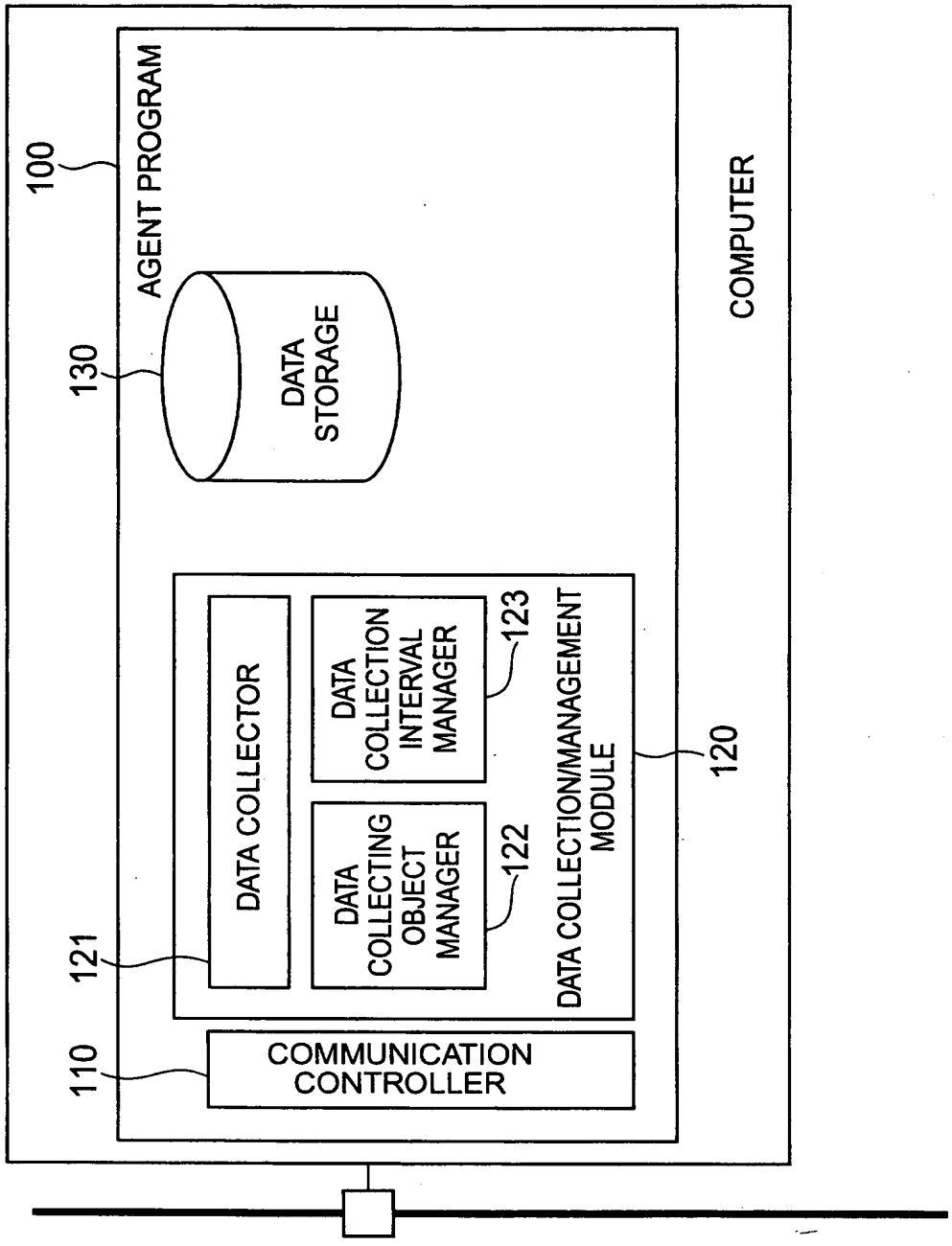

COMPUTER
AGENT PROGRAM
100
DATA STORAGE
130
DATA COLLECTION/MANAGEMENT MODULE
120
DATA COLLECTOR
121
DATA COLLECTION INTERVAL MANAGER
123
DATA COLLECTING OBJECT MANAGER
122
COMMUNICATION CONTROLLER
110

FIG. 2

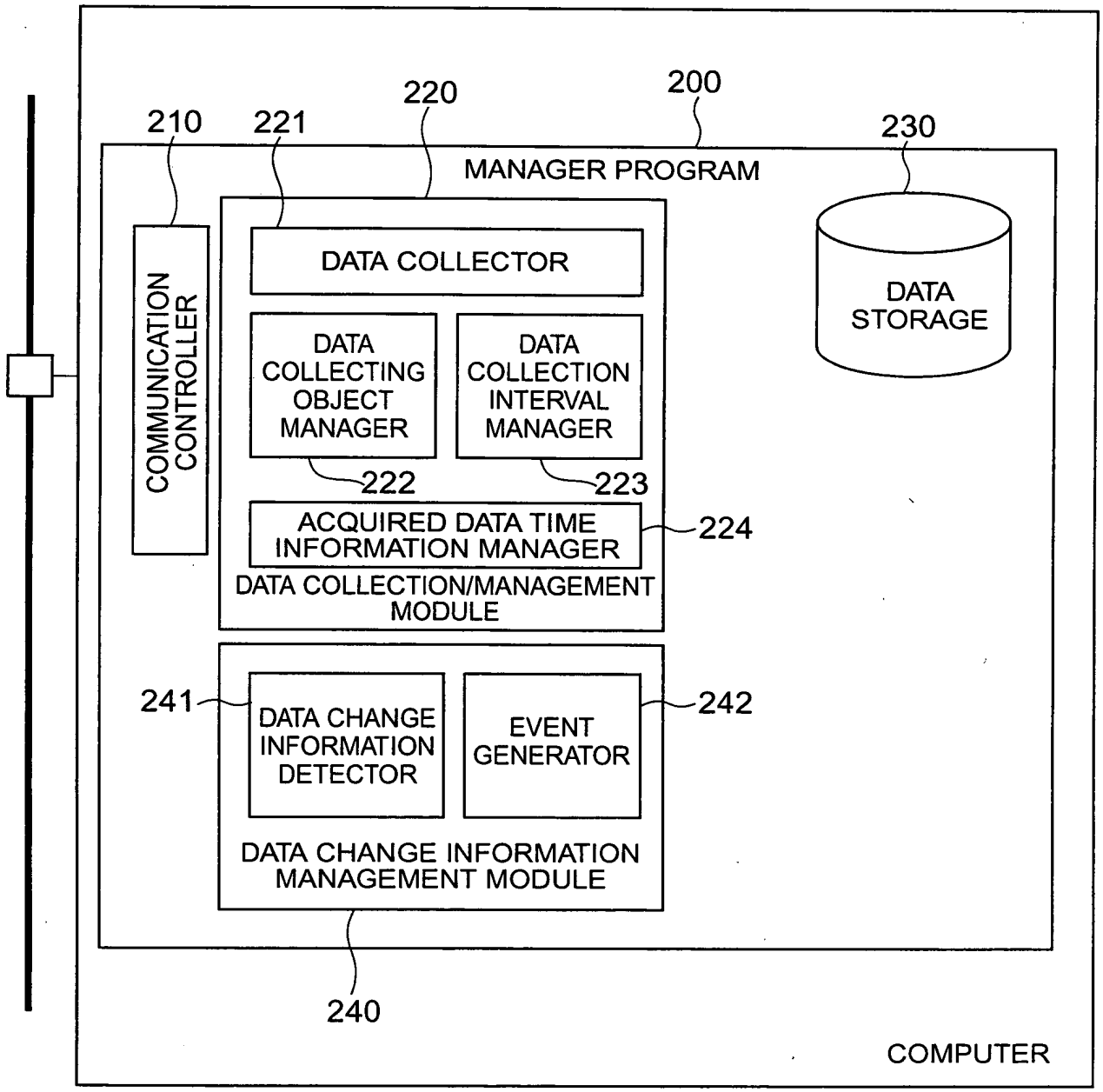

210
221
220
200
230
MANAGER PROGRAM
COMMUNICATION CONTROLLER
DATA COLLECTOR
DATA COLLECTING OBJECT MANAGER
DATA COLLECTION INTERVAL MANAGER
DATA STORAGE
222
223
ACQUIRED DATA TIME INFORMATION MANAGER
224
DATA COLLECTION/MANAGEMENT MODULE
241
DATA CHANGE INFORMATION DETECTOR
EVENT GENERATOR
242
DATA CHANGE INFORMATION MANAGEMENT MODULE
240
COMPUTER

FIG. 3

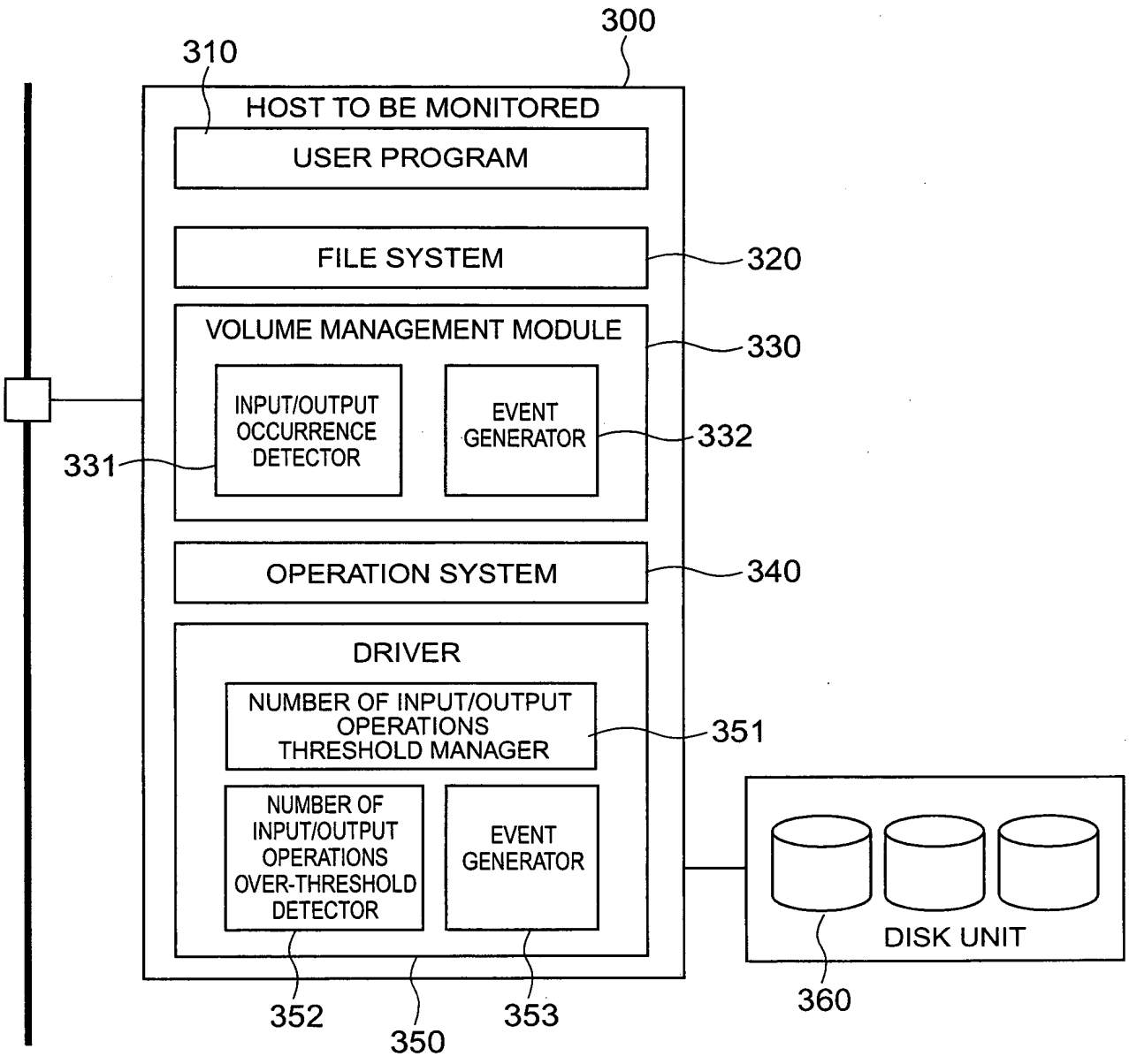

300
310
HOST TO BE MONITORED
USER PROGRAM
FILE SYSTEM
320
VOLUME MANAGEMENT MODULE
330
INPUT/OUTPUT OCCURRENCE DETECTOR
EVENT GENERATOR
332
331
OPERATION SYSTEM
340
DRIVER
NUMBER OF INPUT/OUTPUT OPERATIONS THRESHOLD MANAGER
351
NUMBER OF INPUT/OUTPUT OPERATIONS OVER-THRESHOLD DETECTOR
EVENT GENERATOR
DISK UNIT
360
352
350
353

FIG. 4

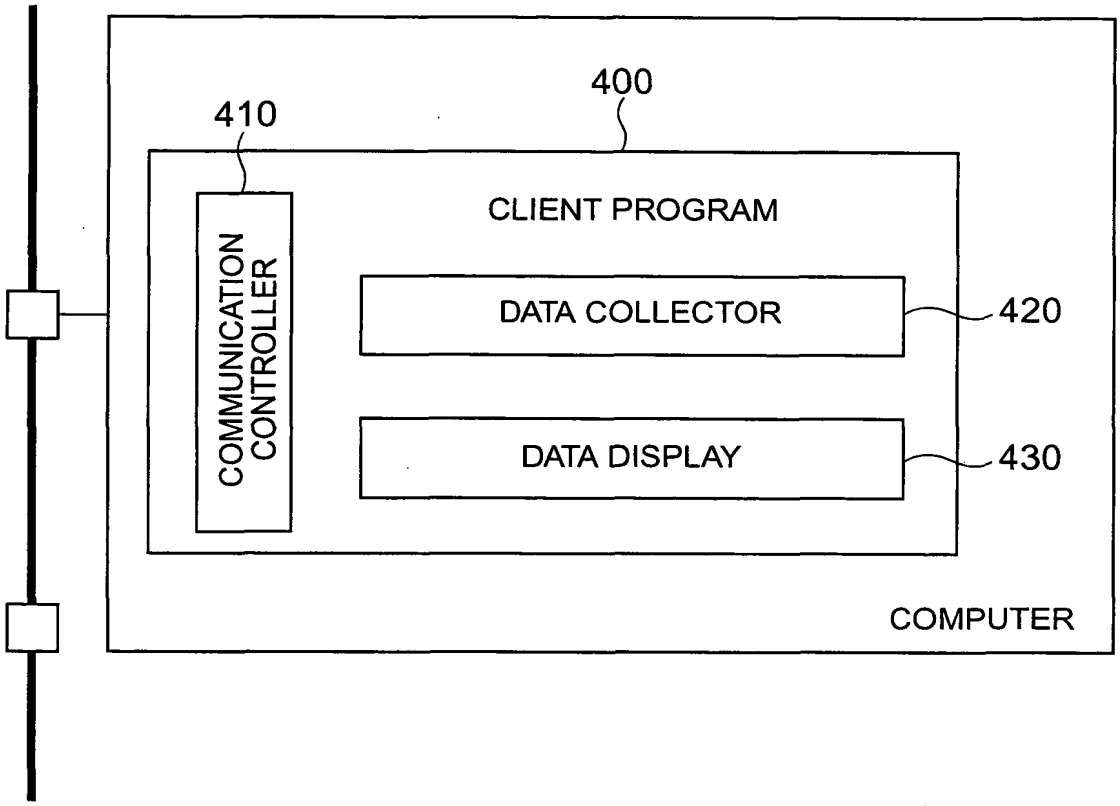


FIG. 5

	510 RESOURCE	520 CAPACITY	530 USED CAPACITY	540 FREE CAPACITY	550 TIME
LINE	FILE SYSTEM 1	5MB	4MB	1MB	2003/01/13 05:00
	FILE SYSTEM 1	5MB	4MB	1MB	2003/01/13 06:00
	FILE SYSTEM 1	5MB	4MB	1MB	2003/01/13 07:00
	FILE SYSTEM 1	5MB	3MB	2MB	2003/01/13 08:00
	FILE SYSTEM 1	5MB	3MB	2MB	2003/01/13 09:00
	FILE SYSTEM 1	6MB	3MB	3MB	2003/01/13 10:00

EXAMPLE OF DATA STORED IN DATA STORAGE 130 MB: MEGABYTE

FIG. 6

	610 RESOURCE	620 CAPACITY	630 USED CAPACITY	640 FREE CAPACITY	650 START TIME	660 END TIME
LINE	FILE SYSTEM 1	5MB	4MB	1MB	2003/01/13 05:00	2003/01/13 07:00
	FILE SYSTEM 1	5MB	3MB	2MB	2003/01/13 08:00	2003/01/13 09:00
	FILE SYSTEM 1	6MB	3MB	3MB	2003/01/13 10:00	9999/12/31 23:00

EXAMPLE OF DATA STORED IN DATA STORAGE 230 MB: MEGABYTE

FIG. 7

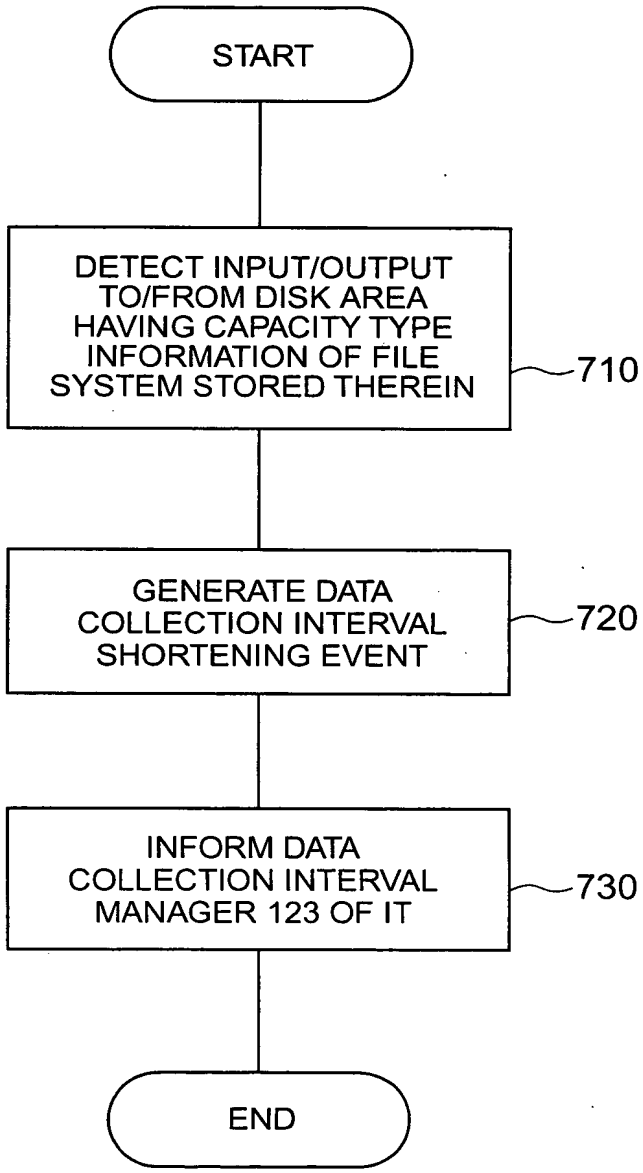

START
DETECT INPUT/OUTPUT TO/FROM DISK AREA HAVING CAPACITY TYPE INFORMATION OF FILE SYSTEM STORED THEREIN
710
GENERATE DATA COLLECTION INTERVAL SHORTENING EVENT
720
INFORM DATA COLLECTION INTERVAL MANAGER 123 OF IT
730
END

FIG. 8

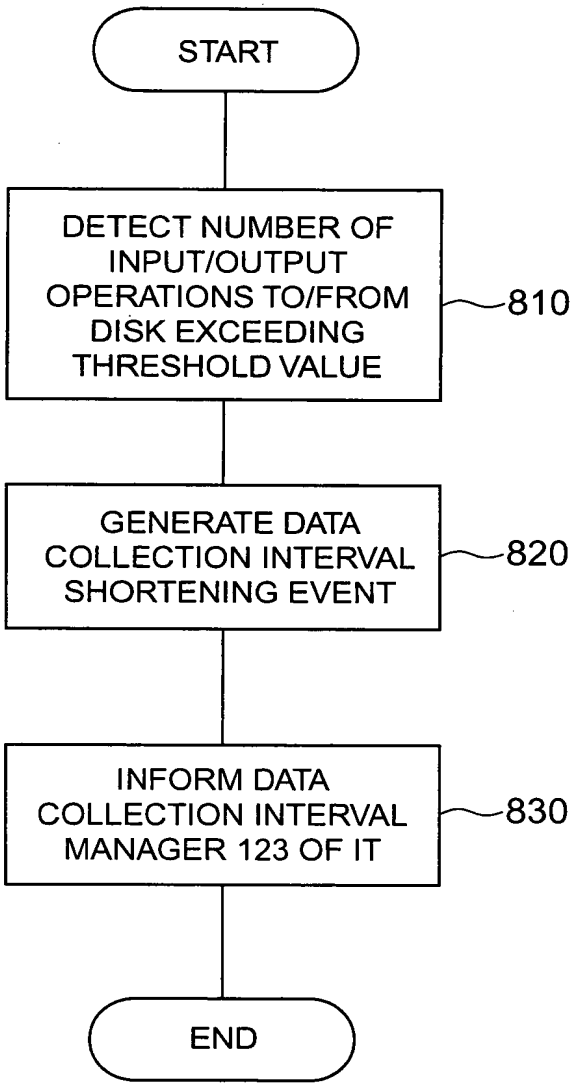

START
DETECT NUMBER OF INPUT/OUTPUT OPERATIONS TO/FROM DISK EXCEEDING THRESHOLD VALUE
810
GENERATE DATA COLLECTION INTERVAL SHORTENING EVENT
820
INFORM DATA COLLECTION INTERVAL MANAGER 123 OF IT
830
END

FIG. 9

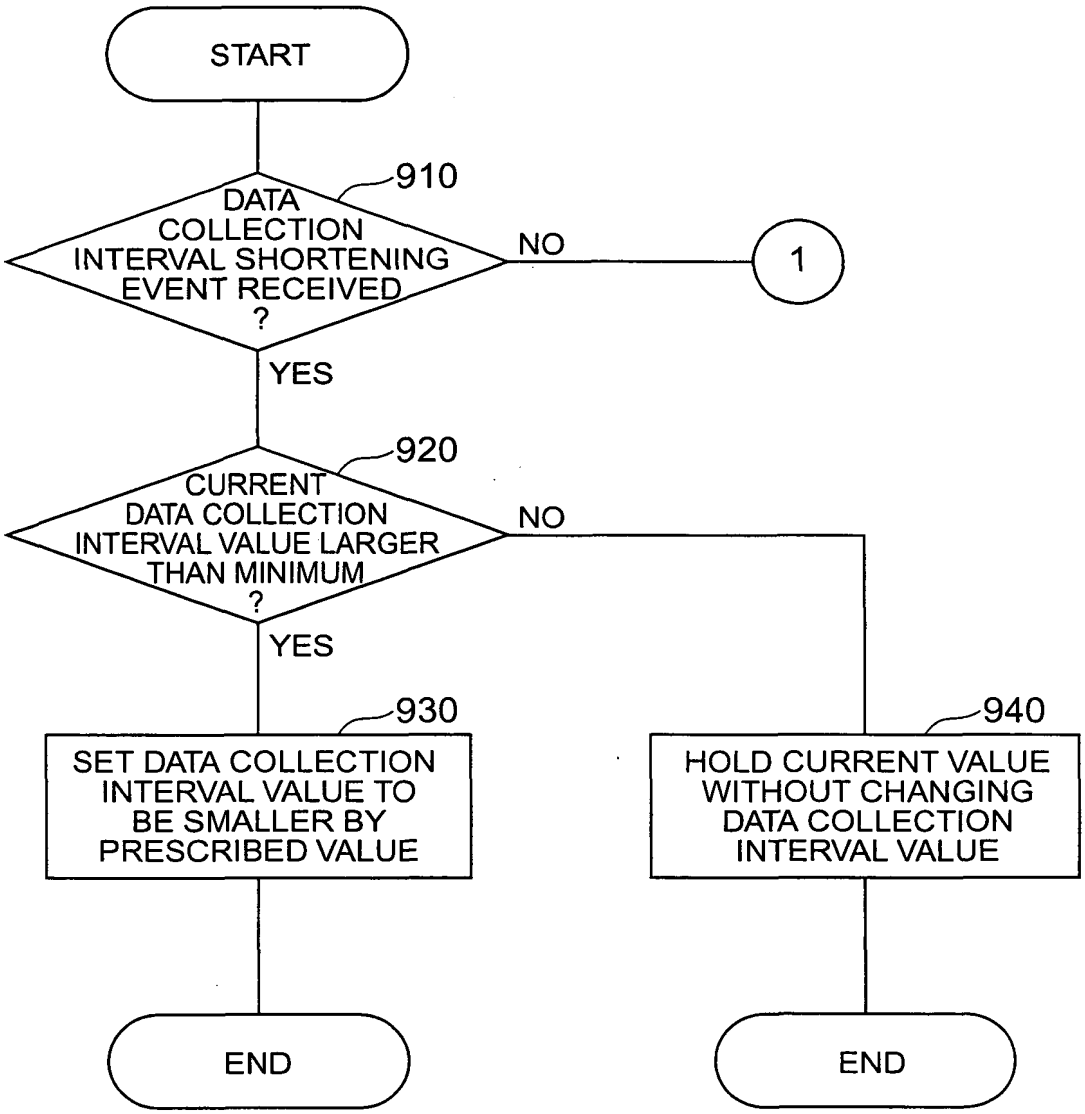

START
910
DATA COLLECTION INTERVAL SHORTENING EVENT RECEIVED ?
NO
1
YES
920
CURRENT DATA COLLECTION INTERVAL VALUE LARGER THAN MINIMUM ?
NO
YES
930
SET DATA COLLECTION INTERVAL VALUE TO BE SMALLER BY PRESCRIBED VALUE
940
HOLD CURRENT VALUE WITHOUT CHANGING DATA COLLECTION INTERVAL VALUE
END
END

FIG. 10

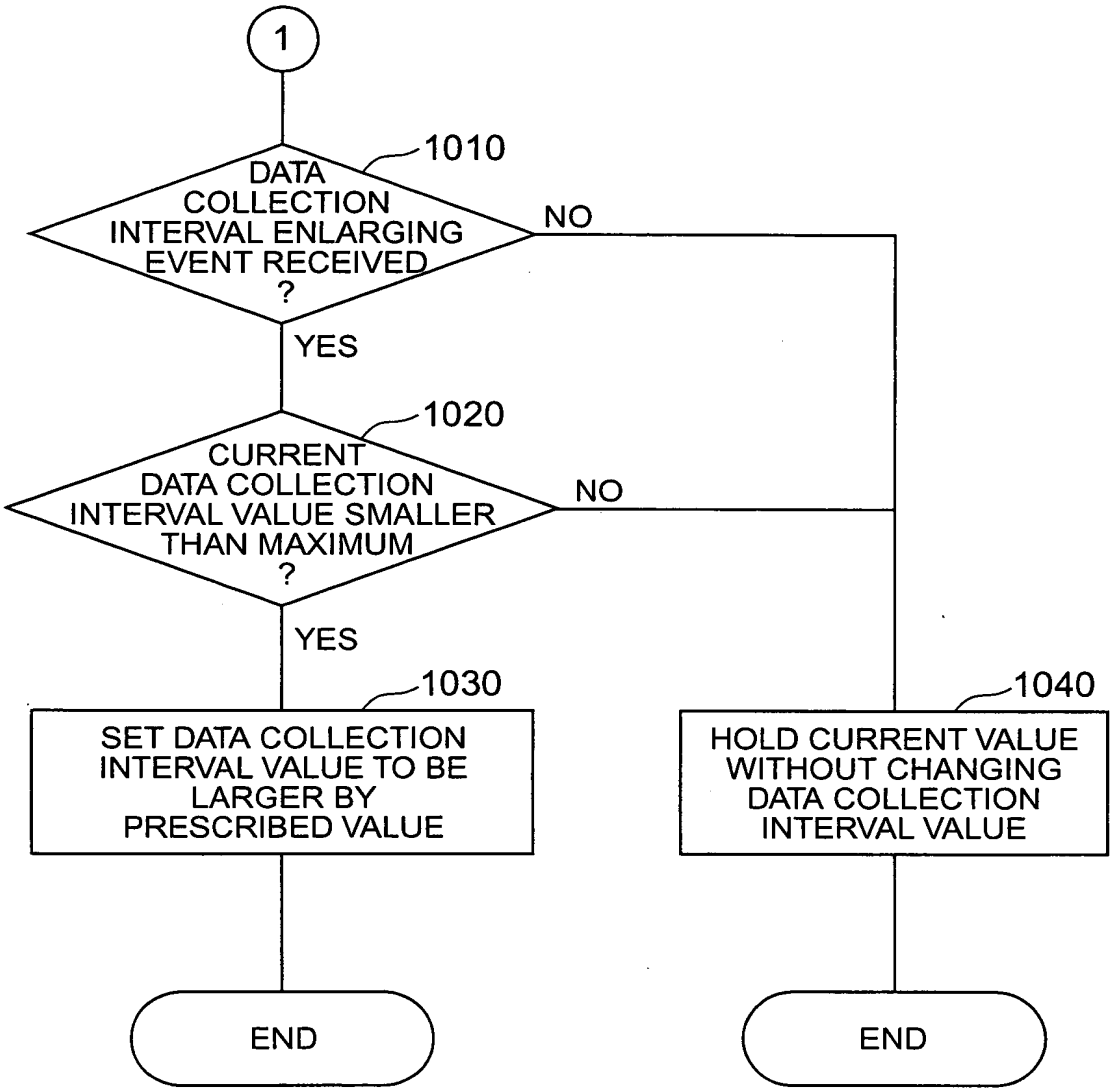

1
1010
DATA COLLECTION INTERVAL ENLARGING EVENT RECEIVED ?
NO
YES
1020
CURRENT DATA COLLECTION INTERVAL VALUE SMALLER THAN MAXIMUM ?
NO
YES
1030
SET DATA COLLECTION INTERVAL VALUE TO BE LARGER BY PRESCRIBED VALUE
1040
HOLD CURRENT VALUE WITHOUT CHANGING DATA COLLECTION INTERVAL VALUE
END
END

FIG. 11

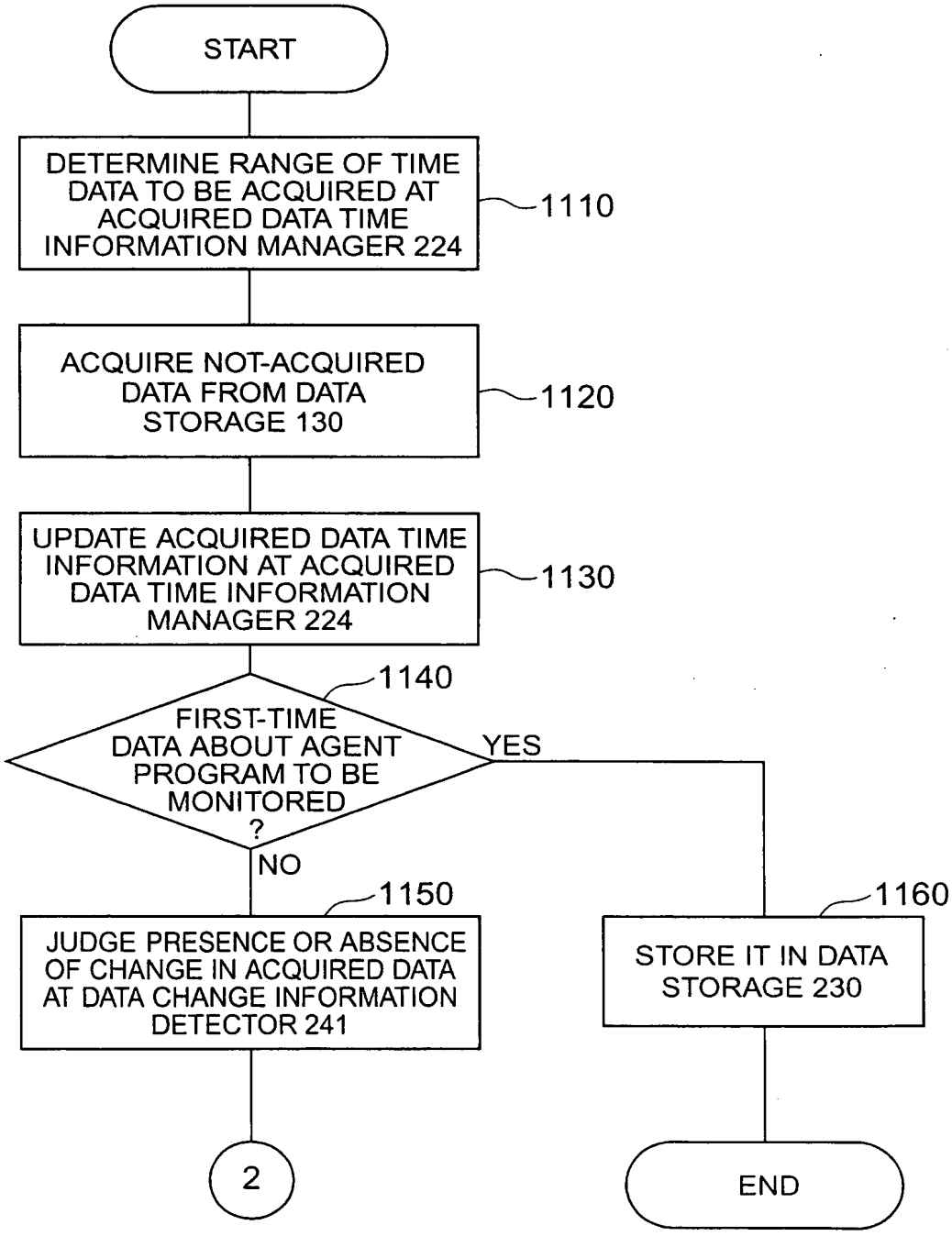

START
DETERMINE RANGE OF TIME DATA TO BE ACQUIRED AT ACQUIRED DATA TIME INFORMATION MANAGER 224
1110
ACQUIRE NOT-ACQUIRED DATA FROM DATA STORAGE 130
1120
UPDATE ACQUIRED DATA TIME INFORMATION AT ACQUIRED DATA TIME INFORMATION MANAGER 224
1130
1140
FIRST-TIME DATA ABOUT AGENT PROGRAM TO BE MONITORED ?
YES
NO
1150
JUDGE PRESENCE OR ABSENCE OF CHANGE IN ACQUIRED DATA AT DATA CHANGE INFORMATION DETECTOR 241
1160
STORE IT IN DATA STORAGE 230
2
END

FIG. 12

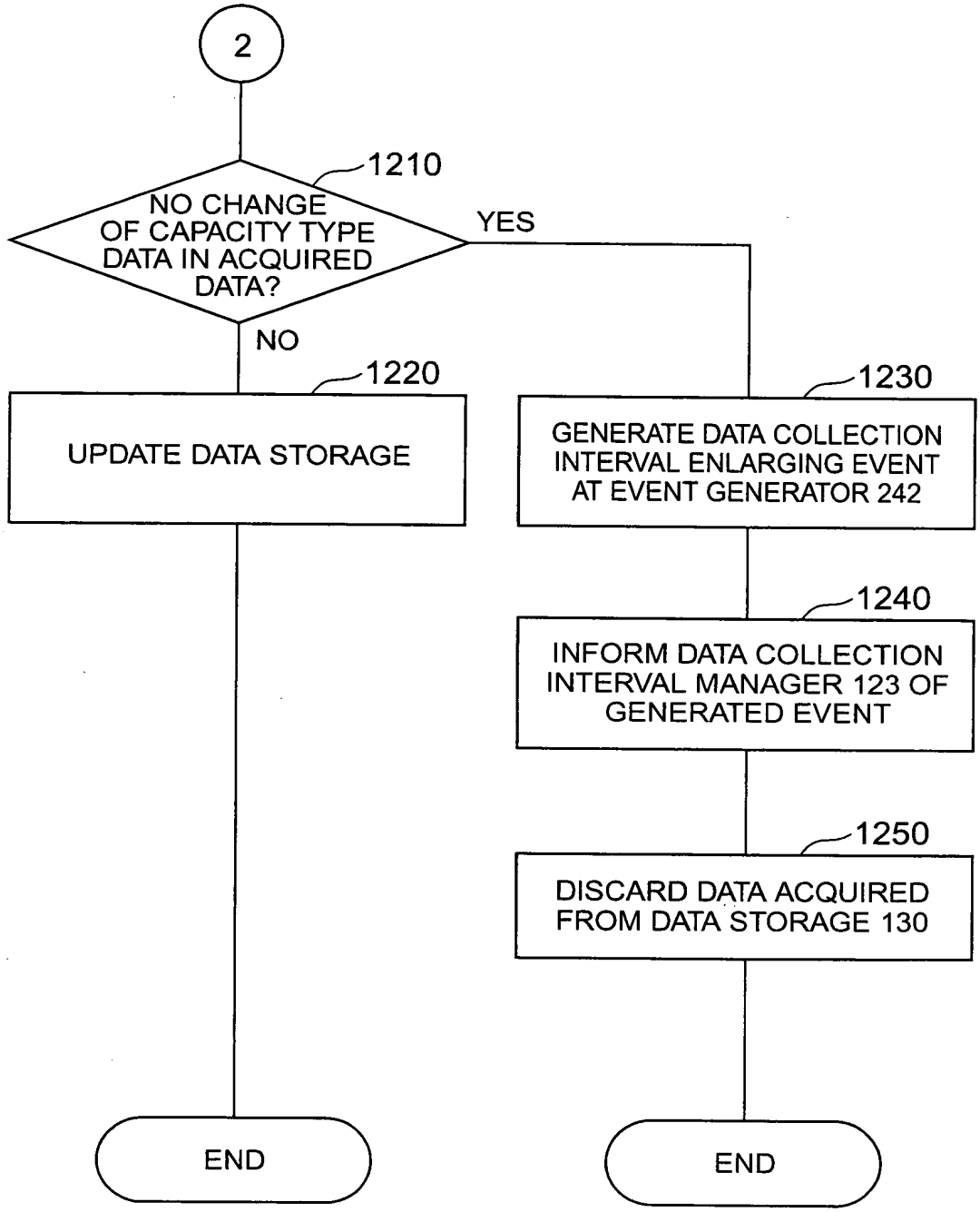

2
1210
NO CHANGE OF CAPACITY TYPE DATA IN ACQUIRED DATA?
YES
NO
1220
UPDATE DATA STORAGE
1230
GENERATE DATA COLLECTION INTERVAL ENLARGING EVENT AT EVENT GENERATOR 242
1240
INFORM DATA COLLECTION INTERVAL MANAGER 123 OF GENERATED EVENT
1250
DISCARD DATA ACQUIRED FROM DATA STORAGE 130
END
END

FIG. 13

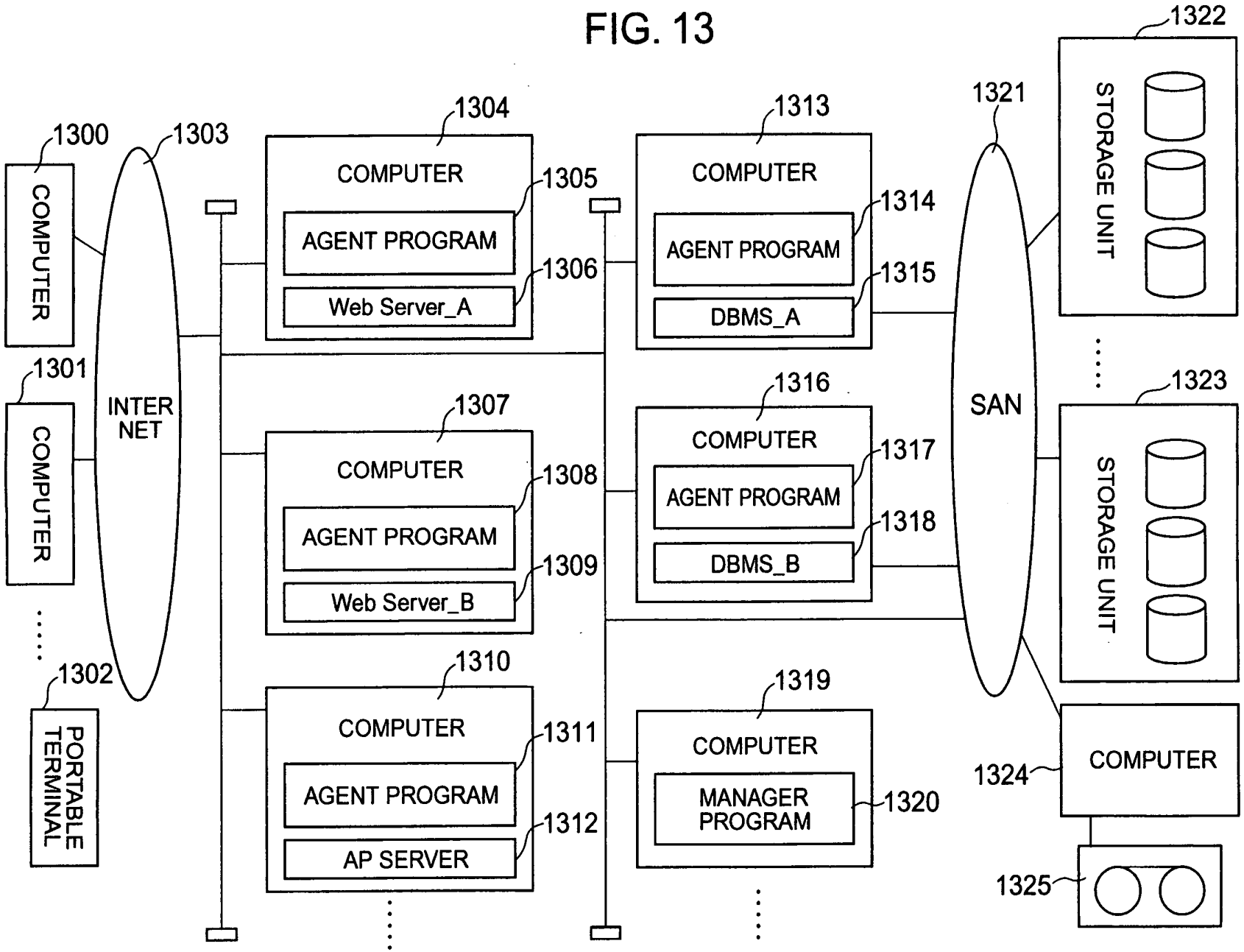

1300
COMPUTER
1301
COMPUTER
1302
PORTABLE TERMINAL
1303
INTER NET
1304
COMPUTER
AGENT PROGRAM
Web Server_A
1305
1306
1307
COMPUTER
AGENT PROGRAM
Web Server_B
1308
1309
1310
COMPUTER
AGENT PROGRAM
AP SERVER
1311
1312
1313
COMPUTER
AGENT PROGRAM
DBMS_A
1314
1315
1316
COMPUTER
AGENT PROGRAM
DBMS_B
1317
1318
1319
COMPUTER
MANAGER PROGRAM
1320
1321
SAN
1322
STORAGE UNIT
1323
STORAGE UNIT
1324
COMPUTER
1325

FIG. 14A

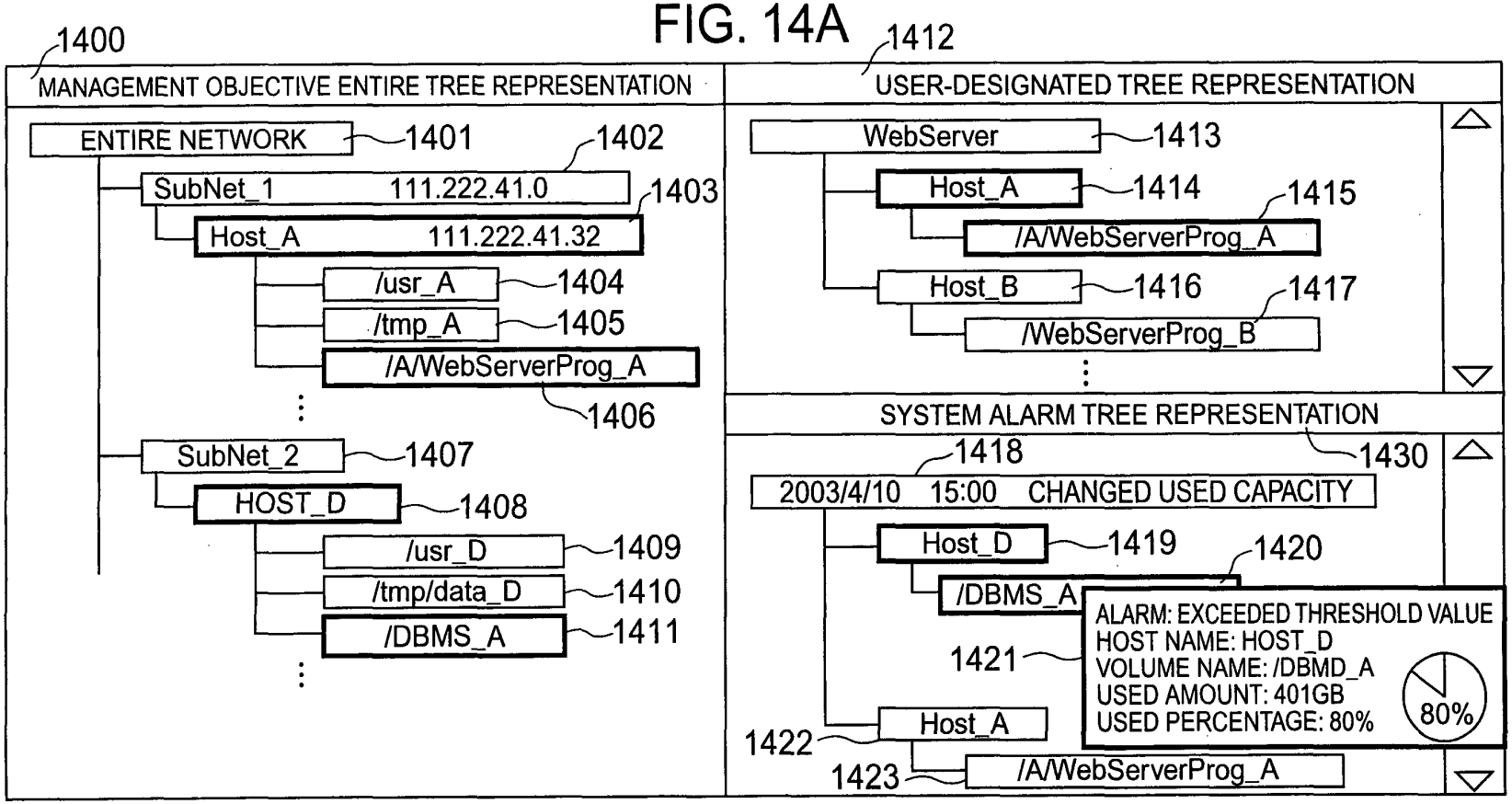


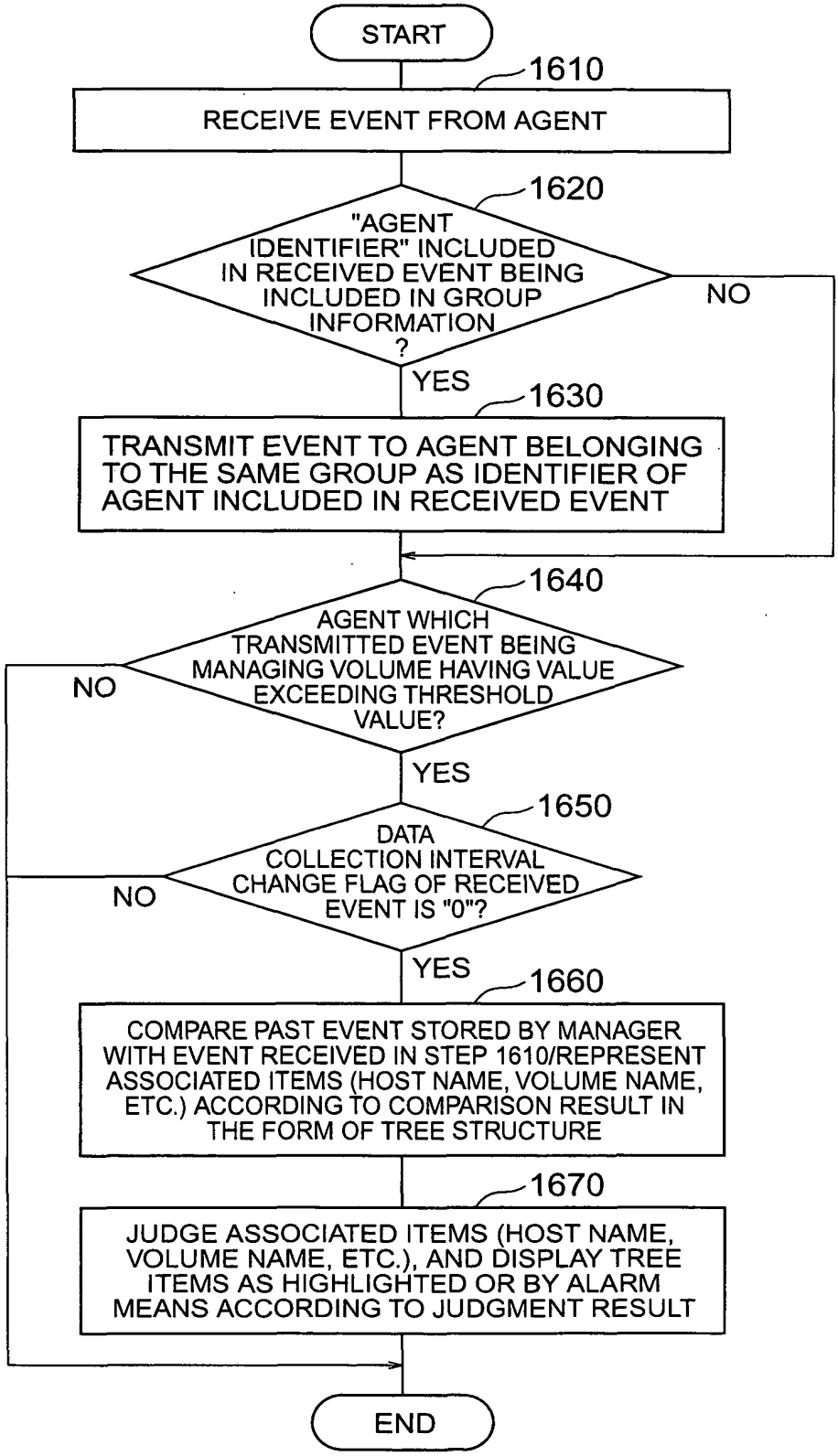
FIG. 14B

1450 USER-DESIGNATED GROUP NAME	1451 HOST NAME/ AGENT NAME	1452 VOLUME NAME	1453 PERFORMANCE INFORMATION DISPLAY DESIGNATION			
			1454 FREE CAPACITY	1455 USED CAPACITY	1456 DEVICE DETAIL	1457 I/O
WebServer	Host_A	/A/WebServerProg_A	DISPLAY	DISPLAY	NO DISPLAY	NO DISPLAY
	Host_B	/WebServerProg_B	DISPLAY	DISPLAY	DISPLAY	NO DISPLAY
⋮	⋮	⋮	⋮	⋮	⋮	⋮

FIG. 15

1500 SUBNET	1501 HOST NAME/AGENT NAME	1502 VOLUME NAME	1503 THRESHOLD VALUE FREE CAPACITY	1504 THRESHOLD VALUE USED CAPACITY	1505 ALARM MESSAGE
SubNet_1	Host_A	/usr_A	20% OR LESS	–	FREE CAPACITY BECAME 20% OR LESS
		/A/WebServerProg_A	–	70% OR MORE	USED PERCENTAGE IS 70% OR MORE
	⋮	⋮	⋮	⋮	⋮
SubNet_2	Host_D	/usr_D	20% OR LESS	–	FREE CAPACITY BECAME 20% OR LESS
		/tmp/data_D	15% OR LESS	–	FREE CAPACITY DECREASED TO 15% OR LESS
		/DBMS_A	–	400GB OR MORE	EXCEEDED THRESHOLD VALUE
⋮	⋮	⋮	⋮	⋮	⋮

FIG. 16


START
1610
RECEIVE EVENT FROM AGENT
1620
"AGENT IDENTIFIER" INCLUDED IN RECEIVED EVENT BEING INCLUDED IN GROUP INFORMATION ?
NO
YES
1630
TRANSMIT EVENT TO AGENT BELONGING TO THE SAME GROUP AS IDENTIFIER OF AGENT INCLUDED IN RECEIVED EVENT
1640
AGENT WHICH TRANSMITTED EVENT BEING MANAGING VOLUME HAVING VALUE EXCEEDING THRESHOLD VALUE?
NO
YES
1650
DATA COLLECTION INTERVAL CHANGE FLAG OF RECEIVED EVENT IS "0"?
NO
YES
1660
COMPARE PAST EVENT STORED BY MANAGER WITH EVENT RECEIVED IN STEP 1610/REPRESENT ASSOCIATED ITEMS (HOST NAME, VOLUME NAME, ETC.) ACCORDING TO COMPARISON RESULT IN THE FORM OF TREE STRUCTURE
1670
JUDGE ASSOCIATED ITEMS (HOST NAME, VOLUME NAME, ETC.), AND DISPLAY TREE ITEMS AS HIGHLIGHTED OR BY ALARM MEANS ACCORDING TO JUDGMENT RESULT
END